

ABSTRACT

A light source employing a passively Q-switched laser, a fiber amplifier and a nonlinear element for performing single pass frequency conversion to generate a pulsed output beam. The Q-switched laser delivers a pulsed primary beam at a primary wavelength which is amplified by fiber amplifier to produce a pulsed intermediate beam containing pulses at the primary wavelength. The Q-switched laser is configured such that these pulses have a certain format. Specifically, these pulses have a format corresponding to a certain frequency conversion efficiency, preferably higher than 10% or even higher than about 50% in single pass frequency conversion performed by the nonlinear element. The nonlinear element includes one or more nonlinear crystals for performing a single or cascaded nonlinear conversion operations. Depending on the application of the light source, the primary wavelength range can be chosen between 860 nm and 1100 nm and the output wavelength can range from 430 nm to 550 nm. This output wavelength range covers blue and green wavelengths.